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Enhancing Nursing Competency and Patients' Satisfaction Using Synergies System Implementation

Ohoud Naif Aldughmi[1*], Taghreed Hussien Alboelola[2], Fatma Abdou Eltaib[3], Samia Khalf Mohamed Soliman[4], Eman Mokhtar Mohammed Gabr[5], Hoda Mohamed Flifel[6], Masouda Hassan Atrous[7], Samah Mahmoud Sofar[8]

[1,3]Medical-Surgical Nursing Department, Faculty of Nursing, Northern Border University, Arar, Kingdom of Saudi Arabia
[2]Public Health Nursing Department, College of Nursing, Northern Border University, Arar, Kingdom of Saudi Arabia
[3]Medical-Surgical Nursing Department, Faculty of Nursing, Ain Shams University, Cairo, Egypt
[4]Nursing Administration, Faculty of Nursing, BUA Badr University in Assuit, Egypt
[5]Medical-Surgical Nursing Department, North private College of Nursing, Arar, Kingdom of Saudi Arabia
[6]Nursing Education Department, North Private College of Nursing, Arar, Kingdom of Saudi Arabia
[7]College of Applied Medical Sciences, Jouf University, Kingdom of Saudi Arabia
[8]Medical-Surgical Nursing, Faculty of Nursing, King Abdulaziz University, Jeddah, Kingdom of Saudi Arabia
[8]Medical-Surgical Nursing, Faculty of Nursing, Alexandria University, Egypt

Author Designation: [1,3,5,6,8]Assistant Professor, [4]Lecturer

*Corresponding author: Ohoud Naif Aldughmi (e-mail: ohoud.aldughmi@nbu.edu.sa).

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Abstract **Background:** Nursing competencies must be in harmony with patients' care needs for enhancing the quality of care and patient satisfaction, especially in high acuity clinical environments. Introduction The AACN Synergy System provides a systematic process of linking patient characteristics to relevant nursing competences30 but research conducted in Middle East healthcare systems is scarce. **Objective:** This study aimed to investigate the effect of using the Synergy System on nursing competency and patient satisfaction in surgery intensive care units. **Methods:** A prepost-phase II quasi experimental study took place at Sohag University hospitals, Egypt. A nonprobability sample design was employed with the participation of 100 staff nurses and 100 hospitalized patients. Nursing competencies of the nurses were evaluated by AACN-based Nursing Competency Scale and patient satisfaction level was assessed with a structured satisfaction questionnaire. We then used paired t-test, chi-square test and Pearson correlation coefficient for statistical analysis with $p<0.05$ indicating significance. **Results:** After the Synergy System educational program, the mean±SD global competency score was increased in nurses (pre 17.6±4.2 vs post 31.8±3.9; $p<0.001$). The proportion of competent nurses increased from 17% before to 91% after intervention. There was also a significant increase in patient satisfaction scores (pre 62.7±2.4 vs post 124.6±3.8; $p<0.001$). There was a significant positive relationship between nurses and their knowledge competence after implementation ($r=0.79$, $p<0.001$). **Conclusion:** Implementation of the Synergy System resulted in significant improvement of nursing capability and patient's satisfaction. The introduction of this conceptual model to hospital training and competence assessment processes could enhance nursing quality and promote person-centred care results.

Key Words Patient Satisfaction, Nursing Competency, Synergies System

INTRODUCTION

Quality nursing care depends largely on continuity of care and the development of effective therapeutic relationships between nurses, patients and their families. Continuity is achieved through consistent nurse-patient assignments, mentorship of less experienced nurses and adaptive staffing strategies that align nursing skills with patient acuity. These elements are particularly critical in surgical and critical care environments, where patients frequently present with complex, unstable and rapidly changing clinical conditions [1].

The Synergy Model, developed by the American Association of Critical-Care Nurses (AACN), provides a professional nursing framework that links patient characteristics with nurse competencies. The model proposes that optimal patient outcomes are achieved when nursing competencies are appropriately matched to patients' clinical needs. Unlike traditional staffing approaches that emphasize nurse-to-patient ratios alone, the Synergy Model focuses on the qualitative match between patient requirements and nursing expertise, supporting both bedside decision-making and long-term workforce planning [2].

The Synergy Model is grounded in eight patient characteristics stability, complexity, predictability, vulnerability, resilience, participation in decision-making, participation in care and resource availability and eight corresponding nursing competencies, including clinical judgment, caring practices, advocacy and moral agency, collaboration, systems thinking, response to diversity, facilitation of learning and clinical inquiry. Together, these elements provide a structured method for assessing patient needs and guiding nursing practice across a variety of healthcare settings [3].

In recent applications, the Synergy framework has been expanded to acknowledge the influence of the care environment on patient outcomes. Incorporating environmental factors such as organizational support, staffing structures and resource availability allows healthcare leaders to better understand how contextual elements interact with patient needs and nursing competencies. This comprehensive approach facilitates informed decisions regarding skill mix, professional development and interprofessional collaboration [4].

Synergy, in organizational and clinical contexts, refers to the enhanced outcomes that occur when individuals and systems work collaboratively toward shared goals. Within healthcare organizations, the Synergies System promotes a common professional language that enables nurses to clearly articulate patient needs and their contributions to care outcomes. This shared understanding supports effective communication among healthcare team members and reinforces the central role of nursing practice in achieving patient-centered outcomes [5].

Patient satisfaction is widely used as an indicator of healthcare quality and reflects patients' perceptions of care in relation to their expectations and experiences. Factors such as nurses' communication skills, clinical competence, responsiveness and ethical conduct significantly influence patient satisfaction levels. At the same time, nurses' professional competency and job satisfaction are closely linked to care quality, patient safety and organizational effectiveness [6].

Although the Synergy Model has been implemented in various international healthcare systems, empirical evidence regarding its effectiveness remains limited in Egyptian clinical settings. Surgical and critical care units in Egypt face challenges related to high patient acuity, workload pressures and variations in nursing education and experience. There is a need for locally generated evidence to evaluate whether implementing the Synergies System can enhance nursing competency and improve patient satisfaction within this context [7].

Significance of the Study

Aligning nursing competencies with patient care needs has become an essential strategy for improving healthcare quality, safety and patient satisfaction, particularly in high-acuity environments such as surgical and critical care units. International nursing literature consistently emphasizes that competency-based care models contribute to improved clinical outcomes, enhanced professional performance and more efficient use of healthcare resources. However, the practical implementation of such models varies widely across healthcare systems and their effectiveness is influenced by organizational context and workforce characteristics [8].

Several international studies have highlighted the value of the Synergy Model as a framework for enhancing nursing performance and patient outcomes. Curley was among the first to translate the Synergy concept from theory into clinical practice, demonstrating that matching patient needs with nurse competencies could improve care coordination and professional accountability [9]. Subsequent studies examining Synergy Model implementation across multiple hospitals reported improvements in nurse satisfaction, communication and perceived quality of care, particularly in intensive and critical care environments [10].

Despite this growing body of international evidence, research examining the application of the Synergy System in Middle Eastern and Egyptian healthcare settings remains limited. Most published studies have been conducted in Western healthcare systems, where staffing structures, professional roles and organizational resources differ substantially from those in developing and middle-income countries. This gap limits the generalizability of existing findings and underscores the need for context-specific research [11].

Effective nurse-patient communication and adequate time allocation for patient care are also strongly associated with patient satisfaction and perceived quality of nursing services. Previous research has shown that patients who perceive nurses as competent, attentive and responsive are more likely to report higher satisfaction levels and greater trust in healthcare services. Conversely, inadequate alignment between nursing workload, competency and patient needs may negatively affect both care quality and patient experiences [12].

Therefore, the present study is significant as it evaluates the effect of implementing the Synergies System on both nursing competency and patient satisfaction within an Egyptian university hospital setting. By examining outcomes among nurses and patients simultaneously, this study contributes empirical evidence that may support evidence-based staffing decisions, targeted professional development programs and the integration of competency-based care models into hospital policies and nursing education curricula.

Aim of the Study

The aim of the present study was to determine the effect of implementing the Synergies System on nursing competency and patients' satisfaction in the surgical and critical care units at Sohag University Hospitals.

Research Hypotheses

- Implementation of the Synergies System will result in a statistically significant improvement in nursing competency levels
- Implementation of the Synergies System will lead to a statistically significant increase in patients' satisfaction with nursing care

METHODS

Design

To achieve the aim of the current study, a quasi-experimental research design with pre- and post-intervention assessment was utilized. This design was selected to evaluate changes in nursing competency and patient satisfaction following implementation of the Synergies System within a real clinical setting, without random assignment to control groups [13].

Setting

The study was conducted in the surgical and critical care units at Sohag University Hospitals, Egypt. These units provide care for patients with complex medical and surgical conditions and require a high level of nursing competency to manage patient needs effectively.

Subject

A convenience sample was used in the present study and consisted of:

- **Staff nurses:** One hundred staff nurses working in the selected surgical and critical care units who agreed to participate in the study
- **Patients:** One hundred hospitalized patients receiving care in the same units during the data collection period

Inclusion criteria for nurses included full-time employment in the selected units and direct involvement in patient care. Nurses on leave or with administrative roles were excluded.

Inclusion criteria for patients included adult patients who were conscious, clinically stable and willing to participate. Patients with cognitive impairment or critical instability were excluded.

Data Collection Tools

Three tools were used for data collection:

Tool (I): Synergies System Scale

This tool consisted of two parts:

- **Part I: Nurses' personal data**, including age, gender, educational qualification and years of clinical experience
- **Part II: Nursing Competency Scale**, adapted from the AACN Synergy Model framework. The scale assessed eight competency domains: advocacy and moral agency, caring practices, clinical judgment, clinical inquiry, collaboration, facilitation of learning, response to diversity and systems thinking. Responses were scored as "yes" (1) or "no" (0). A total score of ≥80% indicated satisfactory competency, while scores below 80% were considered unsatisfactory [14]

Tool (II): Patients' Demographic Data Sheet

This tool collected information related to patients' age, sex and educational level.

Tool (III): Patient Satisfaction Assessment Tool

The patient satisfaction tool was developed based on a review of relevant nursing and healthcare literature. It consisted of 28 items covering three domains: patients' needs and expectations, nurses' communication and nurses' skills and competencies. Responses were measured using a five-point Likert scale ranging from "very satisfied" (5) to "not satisfied" (1). Higher scores indicated greater patient satisfaction [15].

Field Work

Data collection was carried out over a six-month period from August 2023 to January 2024. Prior to implementation of the Synergies System, baseline data were collected from nurses and patients. The Synergies System training program was then implemented over two weeks, totaling 16 hours divided into eight sessions. Post-intervention data were collected immediately after completion of the program using the same tools.

Content Validity and Reliability

The study tools were translated into Arabic and reviewed by a panel of five nursing experts to assess clarity, relevance and applicability. Reliability testing revealed a high internal consistency, with a Cronbach's alpha coefficient of 0.898, indicating acceptable reliability for the instruments used [16].

Statistical Design

Data were coded, entered and analyzed using the Statistical Package for Social Sciences (SPSS), version 25. Descriptive statistics were used to summarize the data, including frequencies and percentages for categorical variables and means with standard deviations for continuous variables. Inferential statistics were applied to examine differences and relationships among study variables.

Paired *t*-tests were used to compare nurses' knowledge, competency scores and patients' satisfaction scores before and after implementation of the Synergies System. Chi-square tests were applied to assess differences in categorical variables. Pearson's correlation coefficient was used to examine the relationship between nurses' knowledge and competency levels. All statistical tests were two-tailed and statistical significance was set at $p \leq 0.05$, with highly significant results reported at $p<0.001$. Effect size estimates were calculated where appropriate to support interpretation of findings [18].

RESULTS

Table 1: Nurses' distribution according to Personal Data

The results indicated that the mean age of the studied nurses was 28.45±5.67 years. The majority of nurses were female and nearly three-quarters had less than ten years of clinical experience. Most participants held technical nursing institute qualifications. These findings reflect a predominantly young nursing workforce with moderate clinical exposure.

Table 1: Nurses distribution according to their Personal data (n = 100)

Personal data	No.	Percent
Age in a year:		
< 30	67	67.0
30 -<40	22	22.0
≥ 40	11	11.0
Mean±SD		28.45±5.67
Gender:		
Male	17	17.0
Female	83	83.0
Experience (in years):		
< 10	73	73.0
≥ 10	27	27.0
Educational Qualification:		
Nursing diploma	27	27.0
Technical institution in nursing	73	73.0

Table 2: Patients' distribution according to demographic data (n = 100)

Demographic data	No.	Percent
Age:		
< 50 years	27	27.0
50 - 55 years	20	20.0
> 55 years	53	53.0
Mean±SD	51.44±8.23	
Sex:		
Male	71	71.0
Female	29	29.0
Educational level:		
Illiterate	53	53.0
Primary	22	22.0
Secondary	10	10.0
University	13	13.0

Table 3: Differences between nurses' mean knowledge scores regarding synergies system Pre- and Post- implementation (n = 100)

Items	Pre M±SD	Post M±SD	t-test	p-value
Advocacy and moral agency	2.1±0.01	4.21±0.05	22.44	0.0001*
Caring practice	2.0±0.06	4.33±0.04	25.33	0.0001*
Clinical judgment	2.22±0.02	3.89±0.87	21.56	0.0001*
Clinical inquiry	2.14±0.01	4.56±0.3	18.77	0.0001*
Collaboration	1.10±0.03	2.94±0.2	24.88	0.0001*
Facilitation of learning	2.23±0.04	3.22±0.3	20.99	0.0001*
Response to Diversity	2.11±0.03	5.33±0.06	25.23	0.0001*
Systemsthinking	2.13±0.04	4.77±0.3	20.79	0.0001*

*High statistical significance at p<0.001

Table 2: Patients' Distribution according to Demographic Data

Analysis of patient demographic characteristics showed that more than half of the patients were older than 55 years, with a predominance of male patients. Over half of the patients were illiterate, highlighting the importance of clear nurse-patient communication and educational support during care delivery.

Table 3: Differences between Nurses' Mean Knowledge Scores regarding the Synergies System Pre- and Post-Implementation

A statistically significant improvement was observed in nurses' mean knowledge scores across all domains of the Synergies System after implementation. Scores related to advocacy and moral agency, caring practices, clinical judgment, clinical inquiry, collaboration, facilitation of learning, response to diversity and systems thinking all showed significant increases in the post-implementation phase (p<0.001). These results indicate that the training program effectively enhanced nurses' knowledge related to Synergy-based care.

Table 4: Correlation between nurses' competency and knowledge regarding synergies system items pre and post-implementation

	Total knowledge			
	Pre		Post	
Parameters	r	p	r	p
Total competency	0.086	0.685	0.792	0.000*

*Correlation is highly significant at p<0.001

Table 5: Differences between patients' satisfaction mean scores regarding synergies system Pre- and Post- implementation (n = 100)

Parameters	Pre M±SD	Post M±SD	t-test	p-value
Patients' satisfaction mean scores	62.67±2.43	124.56±3.78	22.44	0.000*

*High statistical significance at p<0.001

Table 6: Comparison between patients' satisfaction level regarding their needs and expectation, nurses' communication, nurse's skills and competencies pre- and post-synergies system implementation

Patients' satisfaction level	Pre-synergies system implementation		Post-synergies system implementation		p- value
	No.	Percent	No.	Percent	
Very satisfied	33	33.0	73	73.0	0.001*
Satisfied	20	20.0	15	15.0	
Moderately satisfied	15	15.0	12	12.0	
Mildly satisfied	15	15.0	0	0.0	
Not satisfied	17	17.0	0	0.0	

*High statistical significance at p<0.001

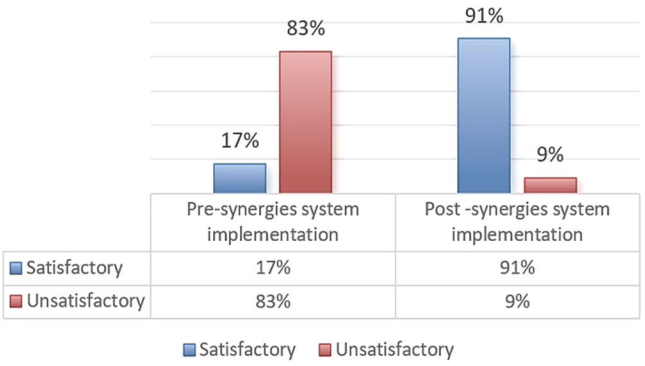

Figure 1: Total nurses' knowledge level regarding synergies system pre- and post-Implementation (n= 100)

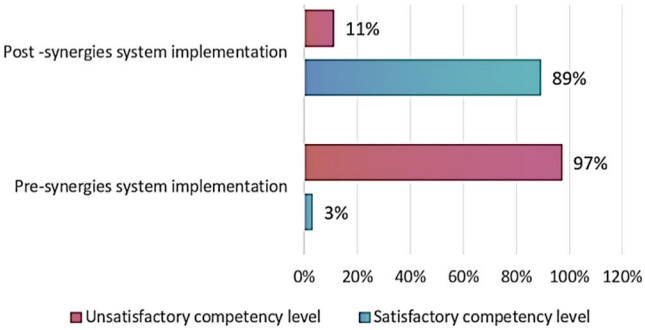

Figure 2: Total nurses' competency level regarding synergies system pre- and post-Implementation (n= 100)

Figure 1: Total Nurses' Knowledge Level regarding the Synergies System Pre- and Post-Implementation

Before implementation of the Synergies System, only a small proportion of nurses demonstrated a satisfactory level of overall knowledge. Following implementation, the majority of nurses achieved satisfactory knowledge levels, reflecting a marked improvement in understanding of the Synergy framework.

Figure 2: Total Nurses' Competency Level regarding the Synergies System Pre- and Post-Implementation

The findings revealed that nearly all nurses exhibited unsatisfactory competency levels prior to the Synergies System implementation. Post-implementation, a substantial improvement was noted, with the majority of nurses achieving satisfactory competency levels. This change was statistically significant ($p<0.001$).

Table 4: Correlation between Nurses' Knowledge and Competency regarding the Synergies System

Post-implementation analysis demonstrated a strong positive correlation between nurses' knowledge and competency levels ($r = 0.792$, $p<0.001$). No statistically significant correlation was found prior to implementation. This finding suggests that improved knowledge following training was associated with enhanced clinical competency.

Table 5: Differences between Patients' Satisfaction Mean Scores Pre- and Post-Implementation

Patients' satisfaction scores increased significantly following implementation of the Synergies System. Mean satisfaction scores post-implementation were markedly higher than pre-implementation scores, with statistically significant differences observed ($p<0.001$). This indicates a positive impact of Synergy-based nursing care on patients' perceptions of care quality.

Table 6: Comparison of patients' satisfaction levels regarding nursing care pre- and post-implementation

Before implementation, approximately one-third of patients reported being very satisfied with nursing communication, skills and competencies. After implementation, the proportion of very satisfied patients increased substantially, while reports of dissatisfaction were eliminated. The difference between pre- and post-implementation satisfaction levels was statistically significant ($p<0.001$).

DISCUSSION

The present study examined the effect of implementing the Synergies System on nursing competency and patient satisfaction in surgical and critical care units. The findings demonstrated statistically significant improvements in nurses' knowledge, competency levels and patient satisfaction following implementation of the Synergies System, supporting the study hypotheses.

The marked improvement observed in nurses' knowledge and competency after implementation reflects the effectiveness of structured, competency-based frameworks in enhancing professional nursing practice. Prior to implementation, the majority of nurses exhibited unsatisfactory competency levels, which may be attributed to limited exposure to structured competency frameworks and high workload demands in critical care settings. Following the intervention, a substantial proportion of nurses achieved satisfactory competency levels, indicating that targeted education and alignment of patient needs with nursing competencies can enhance clinical performance.

These findings are consistent with previous studies demonstrating that application of the Synergy Model improves nurses' clinical judgment, caring practices and collaboration. Curley reported that Synergy-based practice supports professional accountability and improves nurses' ability to respond effectively to complex patient needs [9]. Similarly, Cox *et al.* found that implementing the Synergy Model across hospital systems enhanced nurses' understanding of their roles and improved care coordination [10].

The positive correlation identified between nurses' knowledge and competency levels after implementation further emphasizes the importance of educational interventions in professional development. Nurses who demonstrated greater understanding of the Synergies System were more likely to exhibit higher competency levels, suggesting that knowledge acquisition plays a critical role in translating theory into practice. This finding aligns with earlier research indicating that continuous education and competency-based training significantly influence nursing performance and clinical outcomes [11].

Patient satisfaction also improved significantly following implementation of the Synergies System. Before the intervention, a considerable proportion of patients reported moderate to low satisfaction levels, particularly regarding communication and perceived nursing competence. Post-implementation, patient satisfaction increased substantially across all domains. This improvement may be attributed to enhanced nurse-patient communication, more individualized care and better responsiveness to patient needs resulting from competency-aligned nursing assignments.

These results are consistent with previous studies highlighting the relationship between nursing care quality and patient satisfaction. Rouhi *et al.* reported that increased time spent by nurses in direct patient care and improved communication were associated with higher patient satisfaction levels [12]. The Synergies System may facilitate such improvements by optimizing workload distribution and ensuring that nurses with appropriate competencies care for patients with complex needs.

Overall, the findings of the present study support the Synergies System as an effective framework for improving nursing competency and patient satisfaction in high-acuity clinical environments. The results also contribute to the limited body of evidence regarding Synergy Model implementation in Egyptian healthcare settings, providing context-specific data that may inform nursing management and policy decisions.

CONCLUSIONS

Based on the findings of the current study, it can be concluded that implementation of the Synergies System significantly improved nursing competency and patient satisfaction in surgical and critical care units. The proportion of nurses achieving satisfactory competency increased markedly after implementation and patient satisfaction scores showed statistically significant improvement. A strong positive correlation between nurses' knowledge and competency levels further supports the value of competency-based nursing frameworks. Integrating the Synergies System into nursing practice may enhance care quality and patient-centered outcomes.

Strengths

- Inclusion of both nurses and patients allowed for comprehensive evaluation of professional and patient-related outcomes
- Application of a structured competency-based framework provided measurable and clinically relevant outcomes
- Use of validated tools with high reliability strengthened the credibility of the findings

Limitations

Despite its contributions, this study has several limitations. The use of a convenience sample and single-hospital setting may limit the generalizability of the findings. The absence of a control group restricts causal inference. Additionally, outcomes were assessed immediately after implementation and long-term sustainability of improvements was not evaluated. Self-reported measures may also introduce response bias.

Implications for Practice

- Incorporating the Synergies System into routine nursing assessment and staffing decisions may enhance care quality
- Continuous professional development programs should integrate competency-based frameworks to strengthen nursing practice
- Nursing leaders can use Synergy-based assessments to optimize skill mix and resource allocation in high-acuity units

Future Recommendations

- Replication of the study using larger, multi-center samples to improve generalizability
- Longitudinal studies to assess the sustainability of competency and satisfaction improvements
- Qualitative research to explore nurses' and patients' perceptions of Synergy-based care
- Integration of the Synergies System into undergraduate and postgraduate nursing education curricula

Ethical Statement

Ethical approval was obtained from the Ethics Committee of the Faculty of Nursing, Sohag University (Approval No. 134/6/2023). Written and verbal informed consent was obtained from all participants. Confidentiality and anonymity were ensured and the study was conducted in accordance with the principles of the Declaration of Helsinki (2013 revision) [17].

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